0036-00193

SFUND RECORDS CTR
88000262

***** CONFIDENTIAL *****
***** PREDECISIONAL DOCUMENT *****

SUMMARY SCORESHEET FOR COMPUTING PROJECTED HRS SCORE

SITE NAME: Phelps Dodge Douglas Reduction Works

CITY: Douglas COUNTY: Cochise

EPA ID #: AZD008387143 EVALUATOR: Hollis E. Phillips

JOB #: 41-62450.50.20 SCORE DATE: February 13, 1997

LATITUDE: 31°20'51" LONGITUDE: 109°35'16" T/R/S 24S / 27E / 15

THIS SCORESHEET IS FOR A: ☐ PA ☐ SI ☐ ESI ☐ SI Sum ☐ PA Sum ☒ Other (Specify) ESI/RI

RCRA STATUS (check all that apply):
☐ Generator
☐ Small Quantity Generator
☐ Transporter
☐ TSDF
☒ Not listed in RCRA Database as of (date of print out) 3/4/92

STATE SUPERFUND STATUS

☐ BEP (date) _____ ☐ WQARF (date) _____

☒ No State Superfund Status (date) _____

	S pathway	S^2 pathway
Groundwater Migration Pathway Score (S_{gw})	26.733	714.58
Surface Water Migration Pathway Score (S_{sw})	*	*
Soil Exposure Pathway Score (S_s)	*	*
Air Migration Pathway Score (S_a)	*	*
$S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		714.58
$(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4$		178.645
$\sqrt{(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4}$		13.36

Pathways not assigned a score (explain):

* Pathways evaluated qualitatively not quantitatively

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

Likelihood of Release	Maximum Value	Projected Score	Rationale	Data Qual.
1. Observed Release	550	550	GW-1	H
2. Potential to Release				
2a. Containment	10			
2b. Net Precipitation	10			
2c. Depth to Aquifer	5			
2d. Travel Time	35			
2e. Potential to Release [lines 2a x (2b+2c+2d)]	500			
3. Likelihood of Release (higher of lines 1 or 2e)	550	550		
Waste Characteristics				
4. Toxicity/Mobility	a	100	GW-2	H
5. Hazardous Waste Quantity	a	100	GW-3	H
6. Waste Characteristics (lines 4x5, then use table 2-7)	100	10		
Targets				
7. Nearest Well	50	9	GW-4	H
8. Population [d]				
8a. Level I Concentrations	b	0	GW-5	H
8b. Level II Concentrations	b	0		
8c. Potential Contamination	b	372	GW-6	H
8d. Population (lines 8a+8b+8c)	b	372		
9. Resources	5	5	GW-7	H
10. Wellhead Protection Area	20	20	GW-8	H
11. Targets (lines 7+8d+9+10)	b	401		
Likelihood of Release				
12. Aquifer Score [(lines 3 x 6 x 11)/82,500] [c]	100	26.733		

Groundwater Migration Pathway Score

13. Pathway Score (Sgw), (highest value from line 12 for all aquifers evaluated)	100	26.733 [c]	

Aquifer Evaluated Douglas Groundwater Basin

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c Do not round to nearest integer.
d Use additional tables.

GROUNDWATER PATHWAY CALCULATIONS

8. Population

Actual Contamination

Well Identifier	Contaminant Detected	Concentration (note units)	Benchmark	(A) Apportioned Population Well Serves	(B) Level* Multip.	(A x B)

Sum (AxB) Level I _____

Sum (AxB) Level II _____

* Multipliers
- Level I = 10
- Level II = 1

Potential Contamination

Distance (Miles)	Total Number of Wells Within Distance Ring	Total Population Served by Wells Within Distance Ring	Distance-Weighted Population Values "Other Than Karst" (Table 3-12)** (A)
0 - 1/4	0	0	0
> 1/4 to 1/2	0	0	0
> 1/2 to 1	1	2,375	523
> 1 to 2	41	4,875	939
>2 to 3	47	12,009	2,122
>3 to 4	42	2,506	131
		Sum (A)	3,715

Potential contamination = $\frac{\text{Sum (A)}}{10}$ = 372

** For drinking water wells that draw from a karst aquifer, see the Distance-Weighted Population Values for "Karst" in Table 3-12.

Aquifer Evaluated Douglas Groundwater Basin

HRS Rationale
Phelps Dodge Douglas Reduction Works
EPA ID #AZD008387143

Groundwater Migration Pathway 1

Projected Observed Release

GW-1: Observed release of selenium to the unconfined aquifer. **550**

GW-2: Toxicity of selenium is 100.
Mobility of an observed release of selenium is 1 (See Table 3-9 Federal Register)

GW-3: Phelps Dodge excavated 15.6 million tons of soil off-site for copper recovery, 15.6 E6/2,500 = 6,240. **100** (See Table 2-6 Federal Register).

GW-4: The nearest well is a municipal supply well owned by the City of Douglas, located approximately 0.75 mile to the north of the site. **9**

GW-5: Chemical analyses of the groundwater was conducted on three of the Phelps Dodge production wells prior to abandonment in 1991. The detection limit for selenium was 2 µg/L (the result was none detected), the maximum contaminant level (MCL) for selenium is 50 µg/L. **0**

GW-6: The City of Douglas operates eight municipal water supply wells within a 4-mile radius of the site. There are 122 domestic water supply wells servicing one household each (3.2 people per household) within a 4-mile radius of the site. See Potential Contamination worksheet. **372**

GW-7: Wells within a 4-mile radius of the site are used for irrigation of land that is five acres or more of commercial feed or food for crops. **5**

GW-8: Arizona has established a Wellhead Protection Area in the Douglas Basin **20**

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

Likelihood of Release	Maximum Value	Projected Score	Rationale	Data Qual.
1. Observed Release	550	550	GW-1	
2. Potential to Release				
2a. Containment	10			
2b. Net Precipitation	10			
2c. Depth to Aquifer	5			
2d. Travel Time	35			
2e. Potential to Release [lines 2a x (2b+2c+2d)]	500			
3. Likelihood of Release (higher of lines 1 or 2e)	550	550		
Waste Characteristics				
4. Toxicity/Mobility	a	100	GW-2	
5. Hazardous Waste Quantity	a	100	GW-3	
6. Waste Characteristics (lines 4x5, then use table 2-7)	100	10		
Targets				
7. Nearest Well	50	9	GW-4	
8. Population [d]				
8a. Level I Concentrations	b	0	GW-5	
8b. Level II Concentrations	b	0		
8c. Potential Contamination	b	372	GW-6	
8d. Population (lines 8a+8b+8c)	b	372		
9. Resources	5	5	GW-7	
10. Wellhead Protection Area	20	20	GW-8	
11. Targets (lines 7+8d+9+10)	b	401		
Likelihood of Release				
12. Aquifer Score [(lines 3 x 6 x 11)/82,500] [c]	100	26.733		

Groundwater Migration Pathway Score

13. Pathway Score (Sgw), (highest value from line 12 for all aquifers evaluated)	100	26.733 [c]	

Aquifer Evaluated Douglas Groundwater Basin

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c Do not round to nearest integer.
d Use additional tables.

GROUNDWATER PATHWAY CALCULATIONS

8. Population

Actual Contamination

Well Identifier	Contaminant Detected	Concentration (note units)	Benchmark	(A) Apportioned Population Well Serves	(B) Level* Multip.	(A x B)

Sum (AxB) Level I _____

Sum (AxB) Level II _____

* Multipliers
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- Level II = 1

Potential Contamination

Distance (Miles)	Total Number of Wells Within Distance Ring	Total Population Served by Wells Within Distance Ring	Distance-Weighted Population Values "Other Than Karst" (Table 3-12)** (A)
0 - 1/4	0	0	0
> 1/4 to 1/2	0	0	0
> 1/2 to 1	1	2,375	523
> 1 to 2	41	4,875	939
>2 to 3	47	12,009	2,122
>3 to 4	42	2,506	131
		Sum (A)	3,715

Potential contamination = $\frac{\text{Sum (A)}}{10}$ = 372

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Aquifer Evaluated Douglas Groundwater Basin

HRS Rationale
Phelps Dodge Douglas Reduction Works
EPA ID #AZD008387143

Projected Observed Release

Groundwater Migration Pathway

GW-1: There are three closed landfills on the Phelps Dodge property. Volatile organic compound analysis of samples collected from temporary wells adjacent to the landfill and upgradient of the site indicated 3 µg/L of tetrachloroethene (PCE) and nondetect, respectively. Observed release of PCE to the unconfined aquifer. **550**

GW-2: Toxicity of PCE is 100.
Mobility of PCE is 1 (See Table 3-9 Federal Register)

GW-3: The landfills occupy approximately 70 acres by 100 feet deep (11,294,237 cy/2,500) **100** (See Table 2-6 Federal Register).

GW-4: The nearest well is a municipal supply well owned by the City of Douglas, located approximately 0.75 mile to the north of the site. **9**

GW-5: Municipal drinking water wells have not detected PCE in their quarterly groundwater sampling. **0**

GW-6: The City of Douglas operates eight municipal water supply wells within a 4-mile radius of the site. There are 122 domestic water supply wells servicing one household each (3.2 people per household) within a 4-mile radius of the site. See Potential Contamination worksheet. **372**

GW-7: Wells within a 4-mile radius of the site are used for irrigation of five acres or more of commercial feed or food crops. **5**

GW-8: Arizona has established a Wellhead Protection Area in the Douglas Basin **20**

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THIS SCORESHEET IS FOR A: ☐ PA ☐ SI ☐ ESI ☐ SI Sum ☐ PA Sum ☒ Other (Specify) ESI/RI

RCRA STATUS (check all that apply):
☐ Generator
☐ Small Quantity Generator
☐ Transporter
☐ TSDF
☒ Not listed in RCRA Database as of (date of print out) 3/4/92

STATE SUPERFUND STATUS

☐ BEP (date) _____ ☐ WQARF (date) _____

☒ No State Superfund Status (date) _____

	S pathway	S^2 pathway
Groundwater Migration Pathway Score (S_{gw})	8.02	64.3
Surface Water Migration Pathway Score (S_{sw})	*	*
Soil Exposure Pathway Score (S_s)	*	*
Air Migration Pathway Score (S_a)	*	*
$S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		64.3
$(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4$		16.1
$\sqrt{(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4}$		4.01

Pathways not assigned a score (explain):

* Pathways evaluated qualitatively not quantitatively

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

Likelihood of Release	Maximum Value	Projected Score	Rationale	Data Qual.
1. Observed Release	550	550	GW-1	H
2. Potential to Release				
2a. Containment	10			
2b. Net Precipitation	10			
2c. Depth to Aquifer	5			
2d. Travel Time	35			
2e. Potential to Release [lines 2a x (2b+2c+2d)]	500			
3. Likelihood of Release (higher of lines 1 or 2e)	550	550		
Waste Characteristics				
4. Toxicity/Mobility	a	1	GW-2	H
5. Hazardous Waste Quantity	a	100	GW-3	H
6. Waste Characteristics (lines 4x5, then use table 2-7)	100	3		
Targets				
7. Nearest Well	50	9	GW-4	H
8. Population [d]				
8a. Level I Concentrations	b	0	GW-5	H
8b. Level II Concentrations	b	0		
8c. Potential Contamination	b	372	GW-6	H
8d. Population (lines 8a+8b+8c)	b	372		
9. Resources	5	5	GW-7	H
10. Wellhead Protection Area	20	20	GW-8	H
11. Targets (lines 7+8d+9+10)	b	401		
Likelihood of Release				
12. Aquifer Score [(lines 3 x 6 x 11)/82,500] [c]	100	8.02		

Groundwater Migration Pathway Score

13. Pathway Score (Sgw), (highest value from line 12 for all aquifers evaluated)	100	8.02 [c]	

Aquifer Evaluated Douglas Groundwater Basin

a Maximum value applies to waste characteristics category.
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GROUNDWATER PATHWAY CALCULATIONS

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		Sum (A)	3,717

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GW-6: The City of Douglas operates eight municipal water supply wells within a four mile radius of the site. There are 122 domestic water supply wells servicing one household each (3.2 people per household) within a four mile radius of the site. See Potential Contamination worksheet. 372

GW-7: Several of the wells within a four mile radius of the site are used for irrigation. 5

GW-8: Arizona has established a wellhead protection Area in the Douglas Basin 20